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10/613,600	07/03/2003	Jurgen Kernhof	DS02-026	7271

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EXAMINER
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NGUYEN, MINH T

ART UNIT	PAPER NUMBER
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2816

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/613,600

Applicant(s)

KERNHOF ET AL.

Examiner

Minh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/1903, 1/15/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it uses legal phraseology and words which can be implied, i.e., "said", "comprising". Correction is required. See MPEP § 608.01(b).

### *Claim Objections*

2. Claims 1-2, 12, 26-27 and 34 are objected to because of the following informalities:

In claim 1, line 22, "battery voltage" should be changed to -- the battery voltage --.

In claim 2, line 1, "control logic" should be changed to -- control logic circuit -- for consistent, see line 2 of claim 1.

In claim 12, line 1, "external" should be changed to -- reverse --.

In claim 26, line 25, "battery voltage" should be changed to -- the battery voltage --.

In claim 27, line 1, "control logic" should be changed to -- control logic circuit -- for consistent, see line 2 of claim 1.

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In claim 34, line 2, "external" should be changed to -- reverse --.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 3-5, 19-22, 28-30 and 40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As per claims 3-5, the specification does not enable the CMOS technology, the DMOS technology and the bipolar technology to implement the recited ASIC circuit in the claims for a person skilled in the art to use and/or practice the invention. It is unclear if these recited limitations are merely observations by the applicants based on a general knowledge that is well known in the related industries or they are invention features. If the applicants consider the recited limitations are novel features, they are required to disclose at least one embodiment for each technique for a person skilled in the art to be able to practice.

As per claims 19-22, the specification does not enable the structure of the circuit used to control the velocity, or the structure of a finite state machine or the structure of the power management which comprises several regulators.

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As per claims 26, 28-30 and 40 are rejected for the reasons noted in details in claims 3-5 and 19-22.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, the term “means to drive at the battery voltage level” recited on line 7 is unclear and confusing, i.e., it is unclear if the term means another output of the power management module or means something else. Further, the term “a means to drive at the battery voltage level” recited on line 8 lacks clear antecedent basis, i.e., it is unclear if this term and the term recited on line 7 discussed herein refer to the same element or different elements. The term “means for reverse supply protection” recited on line 9 is unclear, i.e., it appears the applicant is invoking the means plus function. If so, the specification must clearly disclose which elements and structure shown in the drawings constitute the recited means plus function for proper examination. The term “a means for reverse supply protection” recited on line 10 lacks clear antecedent basis, i.e., it is unclear if this term and the term recited on line 9 discussed herein refer to the same element or different elements. The term “two high-side drivers” recited on line 11 lacks clear antecedent basis, i.e., it is unclear if it is referring to the “high-side drivers” recited on line 8-9. The term “said charge pump” on line 12 lacks antecedent basis. The recitation “two high-side drivers having an input and an output” on line 11 is misdescriptive because the two

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high-side drivers appears having more than an input and an output. The term “a resistor” recited on line 14 is misdescriptive, i.e., there must be at least two resistors. The terms “control signals” recited on lines 12 and 18 lack clear antecedent basis, i.e., it is unclear if they are related, further, it is unclear if they are referring to the one recited on line 3 or the one recited on line 4. The recitation “two low-side drivers having an input and an output” on line 17 is misdescriptive because the two high-side drivers appears having more than an input and an output. The claim is further rejected for failing to particularly point out the structural relationship between elements recited in the claim. Specifically, the structural relationship of the two voltage dividers to the rest of the elements recited on line 15 is confusing and does not make sense. The specification appears to identify resistors 35 and 36 shown in Fig. 2A of the present invention are the two voltage dividers, however, resistor 35 alone or 36 alone cannot be seen as a voltage divider, the midpoint voltages at nodes 42 or 43 cannot be kept as reference voltages by these resistors as recited. In conclusion, with such a fuzzy structural relationship recitations and unclear problems noted herein, the claim appears merely a list of “catalogue of elements”, and therefore, it fails to satisfy the 112, second paragraph requirement.

As per claims 2-25, these claims are rejected because of the indefiniteness of claim 1.

As per claim 26, the same problems exist as discussed in claim 1.

As per claims 27-44, these claims are rejected because of the indefiniteness of claim 26.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,119,000, issued to Schultz.

As per claim 1, Schultz discloses a circuit (Fig. 5, circuit 55) for driving a high-voltage H-bridge (69) using CMOS technology comprising:

a control logic circuit (not shown, however, Schultz discloses the circuit (55) using PWM technique, column 2, lines 19-36, the control logic circuit must inherently exist for receiving the PWM and generating the control signals based on the PWM signal) wherein the input comprises control signals defining the behavior of the H-bridge (the behavior is disclosed in column 2, lines 22-35) and the output are control signals (at nodes 96-99) for the high-side (transistors 61, 62, 65, 66) and the low-side (transistors 63, 64, 67, 68) drivers of the H-bridge;

a power management module (75, voltage regulator) wherein the input is a battery voltage (the power supply to the voltage regulator 75) and the output is a voltage to feed the low-side drivers (the voltage at node 90, 12.8V) and means to drive at the battery voltage level (the level shifters 81 and 83);

two high-side drivers (transistors 61, 62 and transistors 65, 66) wherein the input are control signals (the gates receive control signals from nodes 96 and 98) and a voltage from the charge pump (the voltages from level shifters 81 and 83) and the output is driving the high-side transistors (as shown, the signals are coupled to the gates of the high-side transistors 36 and 38) via resistors (51, 52, 56 and 57);

two voltage dividers (insofar as understood, they are 51, 52 and 56, 57) keeping the reference voltage of the high-side drivers on the voltage levels of the midpoints (55 and 60) of the H-bridge;

two low-side drivers (transistors 63, 64 and transistors 67, 68) wherein the input are control signals (the gates receive control signals from nodes 97 and 99) from the control logic circuit and a voltage from the power management module (75, as shown) and the output is driving the low-side transistors of said H-bridge (as shown);

two high-side transistors (36 and 38) connected as recited;

two low-side transistors (37 and 39) connected as recited; and

a load (48) between the midpoints of said H-bridge.

Shultz does not explicitly disclose means for reverse supply protection as called for in the claim.

The examiner takes Official Notice the fact that including a circuit to protect the potential damages when a supply voltage is connected in a reverse direction in a circuit is old and well-known in the art, especially in the automotive and consumer electronic industries. Such is notoriously well-known that even manuals intended for consumers, which are not persons skilled in the art, are still mentioned.

It would have been obvious to one skilled in the art at the time of the invention was made to include a reverse supply protection circuit in the Schultz's driver circuit to protect (this is the motivation) the Schultz circuit from being damaged when a reverse supply voltage is accidentally applied.

As per claim 2, see column 10, lines 20-22.



As per claims 3-5, Shultz explicitly teaches the implementation of the circuit 55 on an ASIC (column 10, lines 21-22) but he does not explicitly teach or suggest the ASIC is built using different techniques as called for in these claims.

However, implementing an ASIC using CMOS technology, or DMOS technology or bipolar technology are seen as obvious choices by a person skilled in the art depending on specific application.

It would have been obvious to one skilled in the art at the time of the invention was made to implement the Shultz ASIC using any of the recited techniques to suit particular application which is the motivation.

As per claim 6, implementing a circuit inside or outside an ASIC is seen as an obvious decision for the reasons and motivation noted in claim 3.

As per claim 7, the shift level circuit 81 is seen as a charge pump because it shifts (pumps) the voltage from a low level to a high level.

As per claim 15, transistors 37 and 39 are NMOS transistors.

As per claim 16, discussed in claim 1.

As per claim 17, the recited DC motor reads on motor 48.

As per claim 18, the purpose of the H-bridge structure is for changing the direction of the motor, therefore, the signal used to control the direction must be existed.

As per claims 19-22, these recited limitations are merely convenient options which are easily provided by the users. Due to the 112, first paragraph problems, no patentably weight is given to these limitations because they are not seen as inventive features.

*Allowable Subject Matter*

6. Claims 8-14 and 23-25 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 8-9 are allowable because the prior art of record fails to disclose or suggest the inclusion of a charge pump having a switching network controlled by a clock scheme as recited in claim 8.

Claims 10-11 are allowable because the prior art of record fails to disclose or suggest the inclusion of two external capacitors in the charge pump as recited in claim 10.

Claims 12-13 are allowable because the prior art of record fails to disclose or suggest the inclusion of a transistor controlled by a reverse supply protection circuit to inhibit the reverse supply situation as recited in claim 12.

Claim 14 is allowable because the prior art of record fails to disclose or suggest the inclusion of NMOS power transistors used as high-side transistors.

Claims 23-25 are allowable because the prior art of record fails to disclose or suggest the inclusion of the elements and connections recited in the body of claim 23 in the high driver.

7. Due to the serious indefiniteness of claims 26-44, patentability of these claims can not be determined in this Office action. However, it appears claim 26 includes at least one allowable feature which is noted in claim 8 herein above.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is 571-272-1748. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



4/2/04

Minh Nguyen  
Primary Examiner  
Art Unit 2816